Meeting Minutes

for the 3rd expert meeting of IHRA pedestrian protection
9 - 11 Sept. 1998, European Commission, Brussels, Belgium

Day 1 (Wed. 9 Sept) Directorate-GeneralⅢ Room 24, European Commission

1. Opening of the meeting

The meeting Convener, Mr. Mizuno opened the meeting at 10:00 and Ms. Groebner welcomed delegates by stating a need for this activity for international harmonization thru IHRA, taking it into account that European member countries and Japan have agreed to ratify the '58 Agreement, and pedestrian protection has been a crucial issue under discussion. She prospects of the final Draft which is to be proposed by EEVC Working Group 17 by the end of this year. However she also indicated that it might take some time to put it into force through its procedure, what is called, co-decision by Parliament and Counsel.

2. Roll call of delegates

(See attached sheet Appendix 1)

3. Approval of Draft Minutes from 2nd Meeting

The revised minutes (IHRA/PS/54/R.1) were approved without change.

4. Adoption of meeting agenda

The body approved the agenda, Doc. IHRA/PS/56 with minor changes:
-page 2, 10.6 line 3:change to "the Injury Criteria and Threshold".

5. Report on 4th IHRA Steering Committee

Mr. Mizuno introduced that the progress reports was approved with minor wording changes at the 4th Steering Committee held in Windsor Canada May 1998.

Mr. Saul reported that IHRA Steering Committee made a decision to establish WEB-site with a view to open such information to the public as current roster, meeting minutes and any other technical reports etc. He suggested we might use WEB-site in order to promote our activities, and further discuss on how to use WEB-site exchanging views and information. The body noted some of them might

as well be shared by members thru password.

CONCLUSION 1 (Action)

To begin with, Secretary is going to input the roster (only member name) and meeting minutes to Mr. Saul.

6. Pedestrian safety information from member countries

-Europe

Mr. Janssen outlined the 2 main tasks for Working Group 17, referencing information handed out as (Doc. IHRA/PS/61), stating that one task is to review WG10 test methods (1994) and to incorporate into the final report of such necessary adjustments based on new data and knowledge as accident studies and reconstructions, cadaver test etc by December 1998, and the other is to contribute to the work of IHRA until 2001. Of note during his explanation, Mr. Janssen pointed out most crucial discussion items concerning legform to bumper test, upper legform to bonnet leading edge test, and headform to bonnet top test respectively.

CONCLUSION 2 (Action)

Mr. McLean will get information of headform impact test results by skinning headform / nonskinning.

-U.S.

Mr. Saul briefly explained the recent activities in the State that US has been working on to put accident data to the same matrixes format that shows correlation between contact location and pedestrian body region. US also intends getting up speed of head impact area, placing an order for TNO headform devices with ISO specifications. They will try to compare US test procedures with EEVC procedure and ISO's.

-Australia

Mr. McLean reported the recent activities in Australia that they conducted child headform test with bull-bars made of polyethylene in molding process. They found that child headform test was good with HIC Value 600 at 40km/h, comparing to 1600-2000 unprotected vehicle and 20000 steel bar. They are continuing calibration with this company, and trying to encourage them to make the vehicle

safer in a way potentially for pedestrian.
He indicated that there are EEVC headform test in progress since last march with top 10 selling modern cars in Australia. EEVC legform (upper & lower) tests are also designed to launch around the end Sept.

-Japan
Mr. Sasaki reported that the Ministry of Transportation are currently investigating what direction it should take concerning pedestrian protection, and has put inquiries consisting of several topics to JAMA (Japanese automobile manufacturers association) and the other bodies concerning future requirements, necessity of regulation for pedestrian protection and vehicle's technical feasibility for it being enforced.
Mr. Mizuno interpreted that JAMA has requested MOT to observe IHRA work closely what output will be put forward, because IHRA has been organized to aim at international harmonization of regulations after all.

In connection with this topic, safety information surrounding member countries, Mr. Janssen and Mr. Lawrence requested manufacturers to put forward information concerning developments or actions taken for the pedestrian safety or reflecting the EEVC's proposal. Mr. Sasaki introduced that JAMA had sent comments on EEVC pedestrian test procedures, bringing the requests up to:
(Doc. IHRA/PS/64)

1) wait their decision on EEVC test procedures until the ISO and IHRA activities are completed
2) exclude upper legform test procedure
3) build consensus for validity of the EEVC injury criteria

Mr. Sasaki also introduced, in answer to members' query on pedestrian dummy, that Honda has recently released vehicle development news, stating they have developed head impact area like fender, bonnet, bonnet hinge, wiper-pivot the like so as to be able to mitigate pedestrian injury, and they decided to launch new vehicles on the market in the fall. He indicated that Honda developed pedestrian impact simulation and two kinds of 50 percentile male ped dummy so that they can see pedestrian behavior in case of impact.
Members requested information with regard to pedestrian dummy from Honda. It's highly important to find out what validation has been done on this dummy,

and better to validate subsystem components test and modeling as well by full scale dummy.
Mr. Sasaki, however, replied that he does not know about Honda's pedestrian dummy itself and company policy how to deal with ped dummy including its characteristics.

CONCLUSION 3 (Action)
Mr. Mizuno will circulate press information released by Honda, and Mr. Sasaki will try to provide specific information, if possible.
Rather than waiting until all required information concerning dummy can be obtained from Honda, it's required to proceed now with currently available component test, then add to IHRA work items as new information becomes available.

7. Latest report of accident survey from member countries
-Europe
Mr. janssen explained that the accident data from two sources would be available hopefully in November, incorporating them on the matrix format. The one is data from Mr. Oette with Hannover, but still in the process of solving questions. The other is from German Automobile Insurance, and is ongoing in compliance with his request.

CONCLUSION 4 (Action)
Mr. Janssen will forward matrix data to Mr. Mizuno hopefully in November.

-Australia
Hopefully at the next meeting.
-Japan
Mr. Sasaki reported that they had already complied with the request.
-US
Mr. Saul reported US data which shows number of pedestrian injuries by contact location and body region for AIS 2-6 injuries based on the classification categories of NHTSA pedestrian crash data study, putting on the same matrix format.

The body felt that they could see by and large the same tendency in the injury frequency by contact location in the State as those in Japan, although there need

discussions on what is a "passenger vehicle" to apply the test methods to the case. Because US data included "pickup" data, and it's dependent on the definitions.

CONCLUSION 5 (Action)
Mr. Saul will try to split the "pickup" data by the next meeting.

8. Assigned items at the 2nd meeting

-Report of the situation of Bumper/Adult Head accident

As far as a question raised at the last meeting why "head" does contact "front bumper" of cab over engine type vehicle, Mr. Ishikawa indicated that frequency (3 cases) are happened for one person who was a drunken person.

-Limit of computer simulation

Mr. Ishikawa indicated that although now highly sophisticated FEM model is available and useful, computer modeling still do need to be validated with the other tests like component or full scale model tests results, and there need be many assumption in case of contact model, so based on actual experience, more knowledge and skill must be first obtained in order to make use of modeling.

-Report of computer simulation

Mr. Saul distributed "Initial Draft" in answer to the request at the last meeting, putting down his thought how to use computer simulation. It was a topic of a continuation of Mr. Ishikawa's indications on how accurate results computer simulations could build. He felt that they could address to impact velocity, impact locations and impact angle, and computer simulation must be useful in such a way that kinematics can be reconstructed by subsystem test results.

CONCLUSION 6 (Action)
Mr. Mizuno requested that each member investigate this proposal and members were also encouraged to provide responses at the next meeting.

Day 2 (Thur 10 Sept) Directorate-GeneralIII Room 24, European Commission

9. Pending items at the 2nd meeting

-Information on head test procedures

Mr. Ishikawa reported that JARI had conducted the accident reconstruction of

pedestrian injuries, incorporating Mr. Hoyt' study into JARI's, and his findings from the graph (HIC vs. AIS, HIC vs. POD) was to illustrate HIC 1000 would be appropriate as criteria and threshold. (Doc. IHRA/PS/32)

-Information on leg test procedure
Mr. Ishikawa also reported that they had conducted a joint study concerning shearing and bending effects at the knee joint at 40km/h lateral loading with a view to address the damage tolerance and the damage mechanisms of the extended human knee in car-pedestrian contact. He indicated from the comparison of the former studies and the current study that it seems to be the crucial factor which causes differences in damage pattern was velocity, and formed the conclusion that the patter of damage and tolerance level at higher impact velocity differ considerably from the results performed at low velocity. (Doc.IHRA/PS/28)

Mr. Janssen pointed out that there is significant terminological confusion or mix in the discussion, and volunteered to distribute the handout that defined appropriately the related terminology.

-Total Concept of Test Procedure
Mr. Sasaki offered a couple of thoughts, from the manufacturer's viewpoint, on the IHRA pedestrian safety voicing their opinions as to basic standpoint, requirements of cost & benefit, and requirements of feasibility study of vehicle improvement", referencing the handout entitled "total concept of test procedure for IHRA pedestrian safety".(Doc. IHRA/PS/67)
The body, however, indicated that their understanding in the previous meeting was that it did not see a need for discussion of "cost and benefit" as well as infrastructure at this stage, for the question of the moment, but this working group is responsible for addressing the test methods for pedestrian protection, and should focus on building the harmonized test procedures.
Although it is also important to keep in mind what benefit would be achieved in comparison with any negative impact or costs that would occur if regulation existed, there need be another chance to address cost-benefit in the future combined with vehicle feasibility and infrastructure.
Triggered by Mr. Sasaki's handout (Doc. IHRA/PS/67), a lengthy discussion followed.

Of note during this discussion, Mr. Lawrence questioned, in particular, item1 that they are concerned about the viewpoint only to propose the test procedures, focusing on the past accident surveys or existing data, covering the parts of the vehicle that has been injuring pedestrian.
Since vehicle design will change, the whole parts of vehicle which may strike pedestrian should be covered. Otherwise improvements and mitigation measures on the vehicle are to be taken only for adopted test procedures in such a way that may increase obstacles on the other parts of vehicle, while Mr. Mizuno interpreted WG position on the need for harmonized research as follows; Our task is to propose reasonable test procedures based on the accident survey results and existing data until 2001, following the recommendation by IHRA Steering Committee.
He indicated that the reason he is recommending this approach is the fact that we had already agreed to deal with three area (1) adult head, (2) child head, (3) adult leg giving priority at the previous meeting.

Mr. Janssen, however, indicated that rational behind an agreement reached at the last meeting to use computer modeling is to investigate all kind of vehicles to address the contact location, impact velocity, angle etc. for more generic test methods and for generic parts which may cause pedestrian's injuries, but not for the current model based on the past data.

The attending members agreed to support Mr. Janssen's opinion.

During the discussion of the concept of test procedures Mr. Janssen pointed out that this discussion may result in confusion as to what approach is actually needed, and recommended to get information and knowledge straight on a chart (Appendix 2), in order to resolve a conflict, that shows body regions by test tools, test procedures, and acceptance level putting the former lengthwise the latter breadthwise to make situation clear on what is available at hand, and what should be further clarified so that the matrix chart could be filled in with agreed information or knowledge, and with bracketed one as well that need a consensus.
The working group agreed to Mr. Janssen's recommendation following the matrix chart to identify existent information or knowledge, giving priority to adult & child head first, and then develop to other body regions. (Appendix 2)

CONCLUSION 7 (Action)

The test procedures with regard to adult & child head should be addressed for a start, giving the 1st priority, then developed to other body regions that might be secondly child chest, abdomen and pelvis, or adult knee & tibia. The general consensus of the working group was to leave both as the second items for further discuss. Adult chest, abdomen and pelvis are to follow the above body regions. The body agreed to address plural body regions together, not deal with body region one after another so as to be able to cover whole body regions within time frame up to 2001.

-Assigned items at the 1st meeting

(1) Scope weight of the passenger cars and the reason

Mr. Mizuno brought up again the issue on the definition of "passenger vehicle", since the working group assumes that it shall be the vehicle with GVM not exceeding 2.5metric tons, and accommodation of up to 9 occupants.

A lengthy discussion followed, but the group couldn't reach any further agreement on this matter. Mr. Mizuno proposed to leave the definition as it stands for now, and defer building consensus. This topic was to be carried over for an open discussion and proposal until the next meeting.

-Whether the test should include the injury criteria & threshold or not

Mr. Sasaki proposed that a notion of "criteria (ex. HIC) & threshold (ex. 1000)" are important fundamental issues that should be included in the work, particularly in addressing the vehicle feasibility, although Japan position at the 1st meeting was that it did not see a need for "criteria" to establish the test procedures. The body agreed.

-Comparative survey of EEVC/ISO

Mr. Sasaki gave a presentation of "comparisons of adult headform impact test" and "comparisons of legform impact test" (Doc. IHRA/PD/32), but Mr. Mizuno indicated that EEVC's data (1996) should be updated.

CONCLUSION 8 (Action)

Mr. Janssen takes action to rewrite up-to-date data in the chart, and to send back to Mr. Mizuno as soon as possible. (Doc. IHRA/PD/32)

10. Development of the test procedure

Mr. Lawrence provided two papers for a discussion on IHRA test procedures and asked the members for investigation or criticism. The former paper (Doc. IHRA/ PD/65) describes development history and rational behind impactors primarily developed by TRL, and sorted the measures to meet the requirements of EEVC test procedures. As far as the latter paper (Doc. IHRA/PD/68) is concerned, Mr. Lawrence outline the recent improvements or refinements of the impactors as well as certification procedure made by TRL through a large number of tests to cars with a view to perform the practical and repeatable test.

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Mr. Sasaki reviewed the existing and available test procedures, focusing on (1) time window, (2) upper-body mass, (3) biofidelity test respectively, and tried to point out the questions/problems as follows:

* Length of biofidelity time window (40ms) adopted by ISO draft
* Requirement of upper-body mass
* Lack of biofidelity test in the EEVC test procedures

-He also questioned the differences between ISO conceptual impactor and EEVC existing impactor as follows:

* Mass of headform impactor
* Measuring items of legform impactor
* Biofidelity
* Test deflection.

When Mr. Sasaki pointed out the durability and cost for the test as problems of EEVC impactors, members felt that his indications would make no sense because EEVC impactors are compared with nonexistent impactors.

His presentation caused a lengthy dispute about the above "problems" and "differences".

Mr. Lawrence argued that we don't see any problems on the impactors, and both ISO impactors and EEVC impactors are all that different, as he provided a presentation the previous day with regard to the recent improvements or refinements of the impactors.

Mr. Janssen and Mr. Lawrence indicated that we had already agreed to start discussion following the specific chart to begin with impactor, Mr. Sasaki's presentation has not complied with an agreement, and items are mixed up.

CONCLUSION 9 (Action)

The attending members agreed to support an initiative for the test tool (specifications), adult head impactor as No.1, and then to address child head impactor.

Mr. Janssen indicated the need for consideration about which requirements should be taken into account, and how high each requirements should be placed value for impactor development. That is related to priority assessment, an issue which TNO has been carrying out for dummy development referencing; biofidelity, sensitivity, simplicity, anthropometry, repeatability/reproducability, durability, costs, use, compatibility etc.

CONCLUSION 10 (Action)

Mr. Janssen agreed to distribute his recommended requirements list and their significance via E-mail to the working group members.

CONCLUSION 11 (Action)

Mr. Saul is going to get information on FMVSS 201, free motion headform impact specifications for Hybrid 3 head.

CONCLUSION 12 (Action)

Mr. Ishikawa will introduce the research results that JARI has conducted computer simulation concerning HIC value onto bonnet by changing head mass, diameter, skinning / nonskinning.

CONCLUSION 13 (Action)

Mr. Saul will provide a format / document summary as to how we will make a presentation to the IHRA steering committee.
Mr. Janssen also volunteer to distribute the TNO in-house specific format for communication with their contracts.

11. Further activity

Mr. Mizuno asked if the working group needs action list as a discussion article, and requested each member check action items listed on the sheets. A length discussion followed concerning how to / to whom assign the task items.

CONCLUSION 14 (Action)

In answer to "Action list" provided by Mr. Mizuno, members are responsible for feed-back, with comments / modification / updated plan within 1 month, and Mr. Mizuno, in reply to members' feed-back, is going to circulate the revised action plan at latest within 1 month. Mr. Mizuno is also going to assign appropriate member(s) task item(s) to provide information, revising "action list".

12. Next meeting

The next IHRA experts meeting is provisionally scheduled in Australia between from the end of February thru the beginning of March. Members are requested to get back to Mr. McLean with their convenient time frame.

13. Adjournment

Mr. Mizuno thanked all members for attending and adjourned the meeting at 12:40, 11 September.

Appendix 2

Body regions for possible test procedures

Body regions	Priority		Test tool	Test procedure	Acceptance level	
	Adult	Child			Criteria	Threshold
Head	1	1	○TNO 1, ○TNO 2 * TNO 1, * TNO 2	EEVC/ISO		
Neck						
Chest	3	2 ?				
Abdomen	3	2 ?				
Pelvis	3	2 ?				
Femur			TRL	EEVC		
Knee & Tibia	2 ?		TRL/NHTSA/JARI	EEVC/ISO		

Note : ○ : Adult
* : Child